REMARKS

Claims 1-4 and 6-27 are pending in the present application. By this reply, claim 5 has been canceled. Claims 1, 12, 19-20, 22 and 27 are independent claims.

ALLOWABLE SUBJECT MATTER

Applicant appreciates the Examiner's indication that claims 5-8, 13-18 and 23-26 will be allowable if rewritten to overcome the rejection under 35 U.S.C § 112, second paragraph, and to include all of the limitations of the base claim and any intervening claims.

Accordingly, independent claim 1 has been amended to incorporate therein the allowable subject matter of claim 5. This renders independent claim 1 and all of its dependent claims 2-4 and 6-11 allowable over the prior art of record.

Furthermore, to expedite prosecution and without acquiescing to any of the Examiner's allegations made in the Office Action regarding the claims and the rejections, independent claims 12, 19-20, 22 and 27 each have been amended to incorporate therein the allowable subject matter of claim 5 to place the application in condition for allowance. As such, it is believed that independent claims 12, 19-20, 22 and 27 and all of their dependent claims 13-18, 21 and 23-26 are allowable over the prior art of record.

Accordingly, an early indication of allowance of the present application is respectfully requested.

DISCLOSURE OBJECTION

The disclosure has been objected to because of certain minor informalities. To overcome this objection, the specification has been reviewed and revised to correct minor informalities including those informalities specifically pointed out by the Examiner in the Office Action. These modifications to the specification do not add any new matter to the disclosure. Accordingly, reconsideration and withdrawal of the disclosure objection is respectfully requested.

35 U.S.C. § 112, FIRST PARAGRAPH, REJECTION

Claims 1-27 have been rejected under 35 U.S.C § 112, first paragraph, as allegedly containing subject matter which was not described in the specification to enable one skilled in the art to make and use the invention. This rejection is respectfully traversed.

Without acquiescing to any of the Examiner's allegations made in the Office Action regarding this rejection, the mathematical symbol for equations (10) and (25), which is not understood by the Examiner, have been presented in a form that is understood and readily used in U.S. Accordingly,

reconsideration and withdrawal of the rejection based on these reasons is respectfully requested.

35 U.S.C. § 103(a) REJECTION

Claims 1-4, 9-12, 19-22 and 27 have been rejected under 35 U.S.C § 103(a) as being unpatentable over *Liang et al.* (U.S. Patent No. 5,790,131). This rejection is respectfully traversed.

As discussed above, rejected independent claims 1, 12, 19, 20, 22 and 27 have been amended to incorporate therein the allowable subject matter of claim 5 to expedite prosecution and to place the application in condition for allowance. Such modifications should not be viewed as an acquiescence to the appropriateness of the Examiner's rejections.

Accordingly, independent claims 1, 12, 19, 20, 22 and 27 and their dependent claims are allowable over *Liang et al.,* and reconsideration and withdrawal of the rejection based on these reasons is respectfully requested.

CONCLUSION

For the foregoing reasons and in view of the above clarifying amendments, Applicant respectfully requests the Examiner to reconsider and withdraw all of the objections and rejections of record, and earnestly solicits an early issuance of a Notice of Allowance.

Should there be any outstanding matters which need to be resolved in the present application, the Examiner is respectfully requested to contact Esther H. Chong (Registration No. 40,953) at the telephone number of the undersigned below, to conduct an interview in an effort to expedite prosecution in connection with the present application.

Attached hereto is a marked-up version of the changes made to the application by this Amendment.

If necessary, the Commissioner is hereby authorized in this, concurrent, and further replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17; particularly, extension of time fees.

Respectfully submitted,

BIRCH, STEWART, KOLASH & BIRCH, LLP

By ______________________
Joseph A. Kolasch, #22,463

P.O. Box 747
Falls Church, VA 22032-0747
(703) 205-8000

EHC
JAK/EHC:lmh

Enclosure: Version with Markings to Show Changes Made

VERSION WITH MARKINGS TO SHOW CHANGES MADE

In the Specification

The specification has been replaced as follows:

Page 1, line 10, through page 3, line 1, has been replaced as follows:

--The image compression technique of MPEG, MPEG2, H261, H263, etc. is implemented by a Hybrid MC DCT_(Motion Compensation Discrete Cosine Transform) technique. This hybrid MC DCT is classified into an encoding process and decoding processes. In the encoding process, the original image is divided into a plurality of blocks for compressing the information of a spacious region, and a two-dimensional DCT is performed with respect to each block, and a redundancy is decreased in the image or between the images using a correlation on a time axis between the images for decreasing the information of the time region. In addition, in the decoding process, the reverse sequence of the decoding process is performed. In order to implement the MCDCT technique, an encoder and decoder are required.

Figure 1 is a block diagram illustrating a conventional image encoder. As shown therein, an input video signal is subtracted by a subtractor 1 with a motion compensated video signal from a video memory 9 and is inputted via a first switching unit 2 and a DCT unit 3. The DCT unit 3 processes the inputted video signal based on a DCT, and a quantization unit 4 quantizes a DCT-processed video signal and outputs a DCT coefficient q. This coefficient is

reversely quantized by a reverse quantizing unit 6 and is processed based on a reverse DCT by a reverse DCT unit 7 for thereby recovering the original video signal. The thusly recovered video signal is summed by a summing unit 8 with a video signal recovered in the earlier process via a second switching unit 10 and is inputted into the video memory. A controller 5 controls the first and second switching units 2 and 10 and transmits an intra/inter information_(p=mtype; flag for INTRA/INTER), a transmission information (q; flag for transmitted or not), and an quantizing information_(qz=Qp; quantizer indication) to a decoder_(not shown in Figure 1). The video memory 9 outputs a motion vector information_(v=MV; motion vector) to the decoder. The DCT unit 3 outputs a DCT coefficient q to the decoder.--

Page 3, line 8, through page 4, line 1, has been replaced as follows:

--Namely, in the case of the coding technique using a DCT in a system which is capable of coding a still picture or a motion picture, the entire image is divided into a plurality of small images_(for example, 8x8 blocks), and then a transforming operation is performed with respect to the divided blocks, and the original image is processed based on a DCT, and an important information of the original image based on a result of the conversion is included in the low frequency component. As the component becomes high frequency, the important information is decreased. The low frequency component includes an information related to the neighboring block. The DCT transform is performed

without considering a corelation between the blocks. Namely, the low frequency components are quantized by the blocks, so that a continuity between the neighboring blocks is lost. This phenomenon is called as the blocking artifacts.--

On page 4, lines 13-17 have been replaced as follows:

--The low pass filter [experiencially] sets a filter tap or a filter coefficient based on or by selecting_(filter mask) a plurality of pixels near a certain pixel and obtaining an average of the pixels. The recovered images are over smoothed in accordance with the kinds of images, and a compression ratio.--

On page 6, lines 5-15 have been replaced as follows:

--To achieve the above objects, there is provided a method for recovering a compressed motion picture according to an embodiment of the invention, comprising the steps of defining a cost function having a smoothing degree of an image and a reliability with respect to an original image in consideration of the directional characteristics of the pixels which will be recovered and a plurality of pixels near the recovering pixels, obtaining a regularization parameter variable having a weight value of a reliability with respect to an original image based on the cost function, and approximating the regularization parameter variable using the compressed pixel and obtaining a recovering pixel.

These and other objects of the present application will become more readily apparent from the detailed description given hereinafter. however, it should be understood that the detailed description and specific examples, while indicating preferred embodiments of the invention, are given by way of illustration only, since various changes and modifications within the spirit and scope of the invention will become apparent to those skilled in the art from this detailed description.--

On page 6, after the heading "BRIEF DESCRIPTION OF THE DRAWINGS", insert the following paragraph:

--The present invention will become more fully understood from the detailed description given hereinbelow and the accompanying drawings which are given by way of illustration only, and thus as not limitative of the present invention and wherein:--

On page 6, lines 18-19 have been replaced as follows:

--Figure 2 is a block diagram illustrating an apparatus for recovering a compressed motion picture according to an embodiment of the present invention;--

On page 7, lines 7-18 have been replaced as follows:

A

--Figure 2 is a block diagram illustrating an apparatus for recovering a compressed motion picture according to an embodiment of the present invention. As shown therein, a decoder 201 receives an intra/inter information_(p=mtype), a transmission information_(t), a quantizing information_(qz=Qp), a DCT coefficient q, and a motion vector information_(v=MV; motion vector) from an encoder as shown in Figure 1 and decodes the thusly received information. The encoder and decoder 201 are connected by a communication channel or network. A block removing filter 202 receives a video signal_(Y,U,V), a quantizing variable_(qz=Qp), a macro block type_(mtype), and a motion vector_(v=MV) from the decoder 201 and performs an image compressing process according to the present invention for thereby outputting a recovered video signal.--

On page 8, lines 9-16 have been replaced as follows:

--In the first embodiment of the present invention, a cost function having a directional feature by the unit of pixels is defined, and a regularization parameter is obtained based on the cost function. A[, and a] recoverable pixel is obtained using a value which is actually adapted to the regularization parameter and is processed based on a DCT and a projection.[, and then] Then a resultant data is processed based on a reverse DCT for thereby recovering an image similar to the original image. The above-described operation will be explained in detail.--

A

On page 15, lines 5-9 have been replaced as follows:

--Therefore, the pixels included in the inter macro block are obtained based on Equation 8, and the pixels included in the intra macro block are obtained based on Equation 9. Whether the pixels of the macro block are coded in the intra macro type or in the inter macro type are determined by the intra inter information_(p=mtype).--

Page 15, line 14, through page 16, line 8, have been replaced as follows:

--As seen in Equation 5, each regularization parameter variable includes an original pixel, a neighboring pixel, and a recovering pixel_(compressed pixel). In addition, since the original pixel f(i,j) and four neighboring pixels f(i,j-1), f(i,j+1), f(i-1,j), f(i+1,j) are the original pixels, these values do not exist in the decoder. Therefore, the pixels f(i,j), f(i,j-1), f(i,j+1), f(i-1,j), f(i+1,j) may not be used for an actual computation. Therefore, in order to actually use the pixels f(i,j), f(i,j-1), f(i,j+1), f(i-1,j), f(i+1,j), the compressed pixels g(i,j), g(i,j-1), g(i,j+1), g(i-1,j), g(i+1,j) must be approximated. To implement the above-described approximation, the following three cases are assumed.

First, the quantizing maximum difference of the macro block unit is a quantizing variable_(Qp),--

Page 16, line 11, through page 16, line 10, has been replaced as follows:

A

--Third, the non-uniform values between two pixels of the original <u>image</u> [pixel] are statistically similar to the non-uniform values between two pixels of the compressed image.

As seen in the following Equation <u>10</u> [25], each regularization variable is approximated based on the above-described three cases.

$$
\begin{aligned}
a_{HL} &= \frac{[f(i,j)-f(i,j-1)]^2}{[g(i,j)-f(i,j)]^2} \approxeq [\fallingdotseq] \frac{[g(i,j)-g(i,j-1)]^2}{Q_{pl}^2} \\
a_{HR} &= \frac{[f(i,j)-f(i,j+1)]^2}{[g(i,j)-f(i,j)]^2} \approxeq [\fallingdotseq] \frac{[g(i,j)-g(i,j+1)]^2}{Q_{pl}^2} \\
a_{VT} &= \frac{[f(i,j)-f(i-1,j)]^2}{[g(i,j)-f(i,j)]^2} \approxeq [\fallingdotseq] \frac{[g(i,j)-g(i-1,j)]^2}{Q_{pl}^2} \qquad \text{--(10)} \\
a_{VD} &= \frac{[f(i,j)-f(i+1,j)]^2}{[g(i,j)-f(i,j)]^2} \approxeq [\fallingdotseq] \frac{[g(i,j)-g(i+1,j)]^2}{Q_{pl}^2} \\
a_{T} &= \frac{[f(i,j)-f_{MC}(i,j)]^2}{[g(i,j)-f(i,j)]^2} \approxeq [\fallingdotseq] \frac{[g(i,j)-f_{MC}(i,j)]^2}{Q_{pl}^2}
\end{aligned}
$$

where l represents the l-th macro block, and Qpl represents a quantizing variable of the l-th macro block. As seen in Equation 10, the difference between the original pixel which is the denominator component of each regularization parameter variable and the compressed pixel is approximated based on the quantizing maximum difference, and the difference between the original pixel which is the numerator component and the compressed pixel is approximated

based on the difference with respect to the difference value between the compressed pixel and the neighboring pixel.--

Page 17, line 15, through page 18, line 12, has been replaced as follows:

--As shown therein, in Step ST1, whether the processing pixels are referred to the pixels of the intra macro block or the pixels of the inter macro block is judged. As a result of the judgement, in Steps ST2 and ST3, the regularization parameter variable is obtained. Namely, if the processing pixels are referred <u>to</u> the pixels of **[to]** the intra macro block, in Step ST2, the regularization parameter variables a_{HL} , a_{HR} , a_{VT} , a_{VDar} are obtained based on Equation 9. In addition, if the processing pixels are referred to the pixels of the inter macro block, the regularization parameter variables α_{HL} , α_{HR} , α_{VT} , α_{VD} , α_{T} are obtained in Step ST3. In addition, the pixel f(i,j) is obtained in Step ST4 based on the obtained regularization parameter variable. At this time, if the processing pixels are referred to the pixels of the inter macro block, and the pixels are obtained based on Equation 8, and if the processing pixels are referred to the pixels of the inter macro block, the pixels are obtained based on Equation 9.--

On page 18, lines 14-16 has been amended as follows:

--In Step <u>ST5</u> [[ST5]], a DCT is performed with respect to the pixel f(i,j), and then a quantizing process is performed therefor. Here, the DCT coefficient of the pixel f(i,j) may be expressed as F(u,v).--

On page 23, lines 7-18 have been replaced as follows:

--Next, the cost functions including a smoothing degree and reliability are defined. The regularization parameter variable is included in only the portion_(the second term of the right side in Equation 4) of the reliability with respect to the original pixel and recovered pixel. Differently from this construction, in another embodiment of the present invention, the regularization parameter variable is included in the portion which represents a reliability of the original pixel and recovered pixel as well as is included in the portion which represents the smoothing degree with respect to the original pixel and the neighboring pixel. In addition, the smoothing degree and the reliability of the pixel are opposite each other inn their meaning. Each cost function may be expressed based on Equation 19.--

On page 28, the formula at line 2 has been replaced as follows:

-- $$\frac{1-\alpha_L}{\alpha_L} = \frac{[f(i,j)-f(i,j-1)]^2}{[f(i,j)-g(i,j)]^2} \approxeq [=] \frac{[g(i,j)-g(i,j-1)]^2}{\Phi(Q_p)}$$

$$\frac{1-\alpha_R}{\alpha_R} = \frac{[f(i,j)-f(i,j+1)]^2}{[f(i,j)-g(i,j)]^2} \approxeq [\fallingdotseq] \frac{[g(i,j)-g(i,j+1)]^2}{\Phi(Q_p)}$$

$$\frac{1-\alpha_U}{\alpha_U} = \frac{[f(i,j)-f(i-1,j)]^2}{[f(i,j)-g(i,j)]^2} \approxeq [\fallingdotseq] \frac{[g(i,j)-g(i-1,j)]^2}{\Phi(Q_p)} \quad \text{---(25)}$$

$$\frac{1-\alpha_D}{\alpha_D} = \frac{[f(i,j)-f(i+1,j)]^2}{[f(i,j)-g(i,j)]^2} \approxeq [\fallingdotseq] \frac{[g(i,j)-g(i+1,j)]^2}{\Phi(Q_p)} \quad \text{--}$$

On page 30, lines 2-9 have been replaced as follows:

--In Step ST10, it is judged whether the pixels of the current macro block are the same as the pixels of the previously transmitted macro block based on the COD value. If they are same, in Step ST11, the recovering pixel values are substituted for the pixel values which are previously recovered based on Equation 23. If they are not same, in Step ST12, the regularization parameter variables α_L, α_R, α_U , α_D are obtained based on Equation 26, and the recovering pixel f(i,j) is obtained based on Equation 22 in Step ST13.--

On page 30, after line 18, the following paragraph was added:

--The invention being thus described, it will be obvious that the same may be varied in many ways. Such variations are not to be regarded as a departure from the spirit and scope of the invention, and all such modifications as would be obvious to one skilled in the art are intended to be included within the scope of the following claims.--

In the Claims

Claim 5 has been cancelled.

The claims have been amended as follows:

1. (Amended) A method for recovering a compressed motion picture, comprising the steps of:

defining a cost function having a smoothing degree of an image and a reliability with respect to an original image in consideration of the directional characteristics of the pixels which will be recovered and a plurality of pixels near the [recovering] pixels which will be recovered;

obtaining a regularization parameter variable having a weight value of the [a] reliability with respect to the [an] original image based on a [the] cost function; and

approximating the regularization parameter variable using the compressed pixel and obtaining a [recovering] pixel which will be recovered,

wherein said regularization parameter variable is a weight value with respect to reliability and is determined based on a difference between the original pixel and the compressed pixel and a difference value between the original pixel and the neighboring pixel.

6. (Amended) The method of claim 1 [5], wherein said difference value between the original pixel and the compressed pixel is approximated based on

a quantizing maximum difference, and a difference value between the original pixel and the neighboring pixel is approximated based on a difference value between the compressed pixel and the neighboring compressed pixel.

7. (Amended) The method of claim 1, after the step for obtaining <u>the</u> **[a]** recovering pixel, further comprising a step for performing a DCT with respect to the recovering pixels, projecting the recovering pixels in accordance with pixel value which will be processed, and performing a reverse DCT with respect to the projected images, and in said projecting step, a recovering image is projected at a subset for setting a range of DCT coefficients of a compressed image, and a maximum quantizing difference of the macro block is included in the subset.

8. (Amended) The method of claim 1, wherein in said step for approximating the regularization parameter variable, a quantizing maximum difference of <u>a</u> **[the]** macro block unit is a quantizing variable, a quantizing difference is uniformly allocated to each pixel in a corresponding macro block, and the non-uniform values between two pixels of the original image are statistically similar to the non-uniform values between two pixels of the <u>compressed</u> **[original]** <u>compressed</u> image.

11. (Amended) The method of claim 9, wherein in said step for

approximating the regularization parameter variable, a quantizing difference of each pixel is set based on a function of a quantizing variable set by the unit of a [the] macro block, and a weight value is added to the pixel based on the pixel position.

12. (Amended) In a method for recovering a compressed motion image for processing an original pixel f(i,j) based on a DCT by the unit of macro blocks of a MxM size, quantizing the DCT-processed coefficient, transmitting together with [the] motion vector information, reversely quantizing and reversely [PCT] DCT-processing the compressed pixel g(i,j) and recovering an image similar to the original image, a method for recovering a compressed motion picture, comprising the steps of:

defining a cost function M(i,j) having a smoothing degree of an image and a reliability with respect to an original image as a pixel unit in consideration of [with] a directional characteristic between the [recovering] pixels which will be recovered and the pixels neighboring [with] the [recovering] pixels which will be recovered;

adaptively searching a regularization parameter variable having a weight of a reliability with respect to the original image from the cost function M(i,j); and

obtaining a projected pixel P(F(u,v)) using a projection method for mapping the [recovering] pixels which will be recovered in accordance with a

[the] range value of the pixels which will be recovered,

wherein said regularization parameter variable is a weight value with respect to reliability and is determined based on a difference between the original pixel and the compressed pixel and a difference value between the original pixel and the neighboring pixel.

14. (Amended) The method of claim 13, wherein each cost function is obtained according to [like] the following equations:

$$M_{HL}(f(i,j)) = [\ f(i,j) - f(i,j-1)\ ]^2 + \alpha_{HL}\ [\ g(i,j)-f(i,j)\ ]^2$$

$$M_{HR}(f(i,j)) = [\ f(i,j) - f(i,j+1)\ ]^2 + \alpha_{HR}\ [\ g(i,j)-f(i,j)\ ]^2$$

$$M_{VT}(f(i,j)) = [\ f(i,j) - f(i-1,j)\ ]^2 + \alpha_{VT}\ [\ g(i,j)-f(i,j)\ ]^2$$

$$M_{VD}(f(i,j)) = [\ f(i,j) - f(i+1,j)\ ]^2 + \alpha_{VD}\ [\ g(i,j)-f(i,j)\ ]^2$$

$$M_{T}(f(i,j)) = [\ f(i,j) - f_{MC}(i,j)\ ]^2 + \alpha_{T}\ [\ g(i,j)-f(i,j)\ ]^2$$

where $f_{MC}(i,j)$ represents a motion compensated pixel, α_{HL}, α_{HR} , α_{VT}, α_{VD} and α_{T} represent a regulation parameter variable with respect to each cost function.

15. (Amended) The method of claim 14, wherein the pixel[s] f(i,j) which will be recovered is obtained based on the following equation when the pixel is

included in <u>an</u> **[the]** inter macro block,

$$f(i,j) = \frac{f(i,j-1) + f(i,j+1) + f(i-1,j) + f(i+1,j) + f_{MC}(i,j) + \alpha_{TOT}g(i,j)}{5 + \alpha_{TOT}}$$

where, $\alpha_{TOT} = \alpha_{HL} + \alpha_{HR} + \alpha_{VT} + \alpha_{VD} + \alpha_{T}$, and

the pixel**[s]** f(i,j) which will be recovered is obtained based on the following equation when the pixel is included in <u>an</u> **[the]** intra macro block,

$$f(i,j) = \frac{f(i,j-1) + f(i,j+1) + f(i-1,j) + f(i+1,j) + \alpha_{TOT}g(i,j)}{4 + \alpha_{TOT}}$$

where $\alpha_{TOT} = \alpha_{HL} + \alpha_{HR} + \alpha_{VT} + \alpha_{VD}$.

17. (Amended) The method of claim 12, wherein in said step for obtaining the projected pixel**[s]** P(F(u,v)), when (u,v)-th value F(u,v) of two-dimensional DCT coefficient of the original image is smaller than G(u,v)-*Qpl, the projected pixel P(F(u,v)) is mapped to G(u,v) - Qpl, and when the value F(u,v) is larger than G(u,v)+Qpl, the projected pixel P(F(u,v)) is mapped to G(u,v) + Qpl, otherwise, the projected pixel P(F(u,v)) is mapped to F(u,v), where G(u,v) represents (u,v)th value of the two-dimensional DCT coefficient of the compression image, and Qpl represents a quantizing maximum difference of the l-th macro block.*

18. (Amended) The method of claim 12, <u>further comprising</u> **[wherein]** the

A

following steps which are [is] repeatedly performed by k-times[, which step includes the steps of]:

defining a cost function M(i,j) having a smoothing degree of an image and a reliability with respect to the original image by the unit of pixels in consideration with a directional characteristic between the pixels which will be recovered and the pixels neighboring the pixels which will be recovered;

adaptively searching a regularization parameter variable having a weight value of a reliability with respect to the original image from the cost function M(i,j); and

obtaining a projected pixel P(F(u,v) using a projection method for mapping the recovering pixel in accordance with a range value of the pixel which will be recovered, for thereby finally obtaining a recovering image.

19. (Amended) In a method for recovering a compressed motion image for processing an original pixel f(i,j) based on a DCT by the unit of macro blocks of a MxM size, quantizing the DCT-processed coefficient, transmitting together with [the] motion vector information, reversely quantizing and reversely [PCT] DCT-processing the compressed pixel g(i,j) and recovering an image similar to the original image, a method for recovering a compressed motion picture, comprising the steps of:

defining a cost function M(i,j) having a smoothing degree of an image and a reliability with respect to an original image as a pixel unit in consideration of

[with] a directional characteristic between the [recovering] pixels which will be recovered and the pixels neighboring [with] the [recovering] pixels which will be recovered;

adaptively searching a regularization parameter variable having a weight of a reliability with respect to the original image from the cost function M(i,j); and

obtaining a finally recovered image of a spatal [spacious] region by obtaining a block DCT coefficient based on a block DCT and obtaining a projected pixel P(F(u,v)) by a projection method for mapping the [recovering] pixels which will be recovered in a range value of the pixel for processing the block DCT coefficient, and performing a reverse DCT,

wherein said regularization parameter variable is a weight value with respect to reliability and is determined based on a difference between the original pixel and the compressed pixel and a difference value between the original pixel and the neighboring pixel.

20. (Amended) An apparatus [A method] for recovering a compressed motion picture, comprising [which is implemented by]:

an image decoding unit for outputting an information with respect to an [a recovering] image which will be recovered such as a decoded image, a quantized [qnautized] variable, a macro block type, and a motion type by decoding a coded image signal; and

a block process eliminating filter for defining a cost function based on a smoothing degree of an image and a reliability with respect to an original pixel in consideration of [with] a directional characteristic between the neighboring pixel and the pixel which will be processed based on the pixels which will be recovered using an information with respect to the [recovering] image which will be recovered inputted from the image decoding unit, adaptively searching a regularization parameter variable which provides a weight of a reliability with respect to the original image for each cost function, and recovering an original pixel using a projection method for mapping the [recovering] pixels which will be recovered in accordance with a range value of the pixels which will be processed,

wherein said regularization parameter variable is a weight value with respect to reliability and is determined based on a difference between the original pixel and the compressed pixel and a difference value between the original pixel and the neighboring pixel.

21. (Amended) The apparatus [method] of claim 20, further comprising:

a DCT unit for performing a DCT with respect to an image recovered by the [a] block process eliminating filter;

a vector projection unit for projecting a [recovering] pixel which will be recovered in accordance with a pixel value after the DCT process is performed; and

an IDCT unit for performing a reverse DCT with respect to the image projected by the vector projection unit.

22. (Amended) In a method for recovering a compressed motion image for processing an original pixel f(i,j) based on a DCT by the unit of macro blocks of a MxM size, quantizing the DCT-processed coefficient, transmitting together with [the] motion vector information, reversely quantizing and reversely [PCT] DCT-processing the compressed pixel g(i,j) and recovering an image similar to the original image, a method for recovering a compressed motion picture, comprising the steps of:

defining a cost function M(i,j) having a smoothing degree of an image and a reliability with respect to an original image as a pixel unit in consideration with a directional characteristic between the [recovering] pixels which will be recovered and the pixels neighboring [with] the [recovering] pixels which will be recovered; and

adaptively searching a regularization parameter variable having a weight of a reliability with respect to the original image from the cost function M(i,j) and a weight value of a smoothing degree of the original image,

wherein said regularization parameter variable is a weight value with respect to reliability and is determined based on a difference between the original pixel and the compressed pixel and a difference value between the original pixel and the neighboring pixel.

27. (Amended) An apparatus [A method] for recovering a compressed motion picture, comprising [which is implemented by]:

an image decoding unit for outputting an information with respect to an [a recovering] image which will be recovered [such as a decoded image], a quantized [qnautized] variable, a macro block type, and a motion type by decoding a coded image signal; and

a block process eliminating filter for defining a cost function based on a smoothing degree of an image and a reliability with respect to an original pixel in consideration of [with] a directional characteristic between a [the] neighboring pixel and the pixel which will be processed based on the pixels which will be recovered using an information with respect to the [recovering] image which will be recovered inputted from the image decoding unit, and adaptively searching a regularization parameter variable which has a weight of a reliability with respect to the original image from each cost function and a weight of a smoothing degree of the original image for thereby recovering an original pixel,

wherein said regularization parameter variable is a weight value with respect to reliability and is determined based on a difference between the original pixel and the compressed pixel and a difference value between the original pixel and the neighboring pixel.